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EXAMINER
DINH, MINH

ART UNIT	PAPER NUMBER
2132	

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
	09/748,441	DAUM ET AL.
Office Action Summary	Examiner	Art Unit	
	Minh Dinh	2132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 January 2006</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>16-22, 24, 25 and 27-31</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>16-20, 24, 25 and 27-31</u> is/are rejected.

7)☒ Claim(s) <u>21 and 22</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>25 July 2005</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This action is in response to the RCE/amendment filed 01/20/2006.

Claims 16-17, 25, 28 and 30 have been amended.

Response to Arguments

2.   Applicant's arguments, see page 9, 3rd paragraph, with respect to

claims 25, 27 and 30-31 have been fully considered and are persuasive. The

rejections of claims 25, 27 and 30-31 under 35 U.S.C 112, first paragraph,

have been withdrawn.

3.   Applicant's arguments with respect to claims 16, 25, 28 and 30 have

been fully considered but they are not persuasive. Applicant argues that

none of Sharrow, Elgamal et al., and Hoffman et al., considered alone or in

combination, describe or suggest changing, within the first appliance, a first

keying variable by installing a master keying variable within the first

appliance and the appliance communication center, where the first keying

variable is used to generate a second authentication word configured to be

compared with the first authentication word, and the second authentication

word is different from the appliance message (page 12, 1st paragraph).

Elgamal discloses a method for authenticating a message using a message

authentication code (MAC). The Elgamal method includes, among other

steps, maintaining a shared sequence number, which meets the limitation of

a shared message counter, at both ends of a communication channel (col.

18, lines 26-30), applying a message, the shared message counter, and a

shared first authentication keying variable, i.e. a session key, to an

authentication algorithm to generate a first authentication word (col. 17, line

56 – col. 18, line 17), and transmitting the first authentication word with the

message to a receiver wherein the receiver uses a shared message counter,

a shared first authentication keying variable stored at the receiver and the

message to generate a second authentication word configured to be

compared with the first authentication word (col. 18, lines 12-38). Elgamal

further discloses changing the session key by storing a master key at both

transmitting and receiving devices and using the master key to generate

new session keys (col. 7, lines 41-59; col. 8, line 44 – col. 9, line 12; col. 8,

lines 57-67).

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner
> and process of making and using it, in such full, clear, concise, and exact terms as to
> enable any person skilled in the art to which it pertains, or with which it is most nearly
> connected, to make and use the same and shall set forth the best mode contemplated by
> the inventor of carrying out his invention.

5.   Claims 16-22, 24-25 and 27-31 are rejected under 35 U.S.C. 112, first

paragraph, as failing to comply with the written description requirement.

The claim(s) contains subject matter which was not described in the

specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had

possession of the claimed invention. Claim 16 recites the limitation

"changing, within the first appliance, a first keying variable by installing a

master keying variable within the first appliance and the appliance

communication center". The limitation is interpreted as either (a) the

master keying variable is the new first keying variable; or (b) the value of

the first keying variable is automatically changed when a master keying

variable is installed. Neither interpretation is supported by the original

disclosure (see figure 7 and corresponding text for discussion of changing

the first keying variable). Therefore, the limitation is considered new

matter. Claims 25, 28 and 30 are rejected on the same basis as claim 16.

Claims that are not specifically addressed are rejected by virtue of their

dependency.

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and
> distinctly claiming the subject matter which the applicant regards as his invention.

7.   Claims 16, 19-22, 24 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. With respect to claim 16, the omitted step is: authenticating the appliance message as stated in the preamble. Claim 30 is rejected on the same basis as claim 16. Claims that are not specifically addressed are rejected by virtue of their dependency.

8.   Claims 16-18, 24-26 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is: wherein applying comprises applying an authentication keying variable. With respect to claim 16, the appliance communication center does not use a keying variable to generate a first authentication word (only the message to be transmitted and a first shared message counter), and the first appliance uses a first keying variable to generate a second authentication word configured to be compared to the first authentication word. The second authentication word would never be equal to the first authentication word unless the appliance communication center also uses a keying variable corresponding to the first keying variable to generate the first authentication word. Claims 25 and 30 are rejected on the same basis

as claim 16. Claims that are not specifically addressed are rejected by virtue

of their dependency.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis

for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or
> described as set forth in section 102 of this title, if the differences between the subject
> matter sought to be patented and the prior art are such that the subject matter as a
> whole would have been obvious at the time the invention was made to a person having
> ordinary skill in the art to which said subject matter pertains. Patentability shall not be
> negatived by the manner in which the invention was made.

10.   Claims 16-19, 24 and 28-29 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Sharrow (6,061,668) in view of Elgamal et al

(5,825,890) and Hoffman et al (6,366,682). Sharrow discloses an appliance

communication network in which an appliance communication center

communicates with different appliances (Abstract; fig. 1, elements 10 and

12-15).

Regarding claims 16-17, 19 and 28, Sharrow discloses a method

comprising: applying at an appliance communication center an appliance

message to an algorithm to generate a first checksum value, transmitting

the appliance message and the first checksum value to an appliance,

receiving the appliance message and the first checksum value by the

appliance, generating a second checksum value based on the received

appliance message, and comparing the first checksum value and the second checksum value to determine the integrity of the appliance message (fig. 2 and corresponding text).

Sharrow does not disclose using a shared message counter shared between the communication center and the appliance, and generating the authentication word using the message, the value of the shared message counter and a shared keying variable shared between the communication center and the appliance. Elgamal discloses a method for authenticating a message using a message authentication code (MAC). The Elgamal method includes, among other steps, maintaining a shared sequence number, which meets the limitation of a shared message counter, at both ends of a communication channel (col. 18, lines 26-30), applying a message, the shared message counter, and a shared first keying variable, i.e. a session key, to an authentication algorithm to generate a first authentication word (col. 17, line 56 – col. 18, line 17), and transmitting the first authentication word with the message to a receiver wherein the receiver uses a shared message counter, a shared first authentication keying variable both stored at the receiver and the received message to generate a second authentication word configured to be compared with the first authentication word (col. 18, lines 12-38). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Elgamal method for

authenticating a message using a message authentication code into the

method of Sharrow; in particular, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to maintain a

shared message counter at the appliance communication center and the

appliance, to apply the message, the shared message counter and a shared

first keying variable to an authentication algorithm to generate an

authentication word, and to transmit the authentication word with the

message. The motivation for doing so would have been to allow the receiver

of a message to authenticate the message.

Sharrow does not disclose changing, within the first appliance, a first

keying variable by installing a master keying variable within the first

appliance and the appliance communication center. Elgamal further discloses

changing the first shared keying variable by storing a master keying variable

at both transmitting and receiving devices and using the master keying

variable to generate a new first shared keying variable (col. 7, lines 41-59;

col. 8, line 44 – col. 9, line 12; col. 8, lines 57-67). It would have been

obvious to one of ordinary skill in the art at the time the invention was made

to change the Elgamal method further to change the first shared keying

variable by storing a master keying variable at both ends of the

communication channel and using the master keying variable to generate a

new first shared keying variable, as taught by Elgamal, in order to enhance security.

Elgamal discloses maintaining a shared message counter in one-to-one communication. Elgamal does not disclose maintaining multiple shared message counters by an entity when the entity communicates with two or more other entities; each of the shared message counters is separately maintained for each of the other entities. Hoffman discloses that an entity (i.e., the data processing center) communicates with other entities (BIA devices) and that the entity maintains multiple shared message counters, each of the shared message counter is separately maintained for each of the other entities (fig. 8; col. 29, line 42 – col. 30, line 59). Since the Sharrow appliance communication center communicates with multiple appliances, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the Sharrow method to maintain, at the appliance communication center, multiple shared message counters, each of the shared message counter is separately maintained for each of the devices, as taught by Hoffman. The motivation for doing so would have been to prevent replay attack when one entity communicates with two or more other entities.

Regarding claims 18 and 29, Elgamal further discloses incrementing

the shared message counter, as stored in the receiving side, after receiving

a genuine authenticated message at the receiving side (col. 18, lines 24-33).

Regarding claim 24, Elgamal further discloses incrementing the shared

message counter, as stored in the sending side, after transmitting the

authenticated message (col. 18, lines 24-30).

11.   Claims 25, 27 and 30-31 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Sharrow in view of Elgamal, Hoffman and "Commercial

Laundry Services".

Regarding claim 25, Sharrow discloses a system in which an appliance

communication center is connected to and communicates with a plurality of

appliances via a network wherein data integrity of messages transmitted

between the appliance communication center and the appliances are

protected using checksums (Abstract; fig. 1, elements 10 and 12-15, figures

2 and 3).

Sharrow does not disclose that the appliance communication center

uses and stores a shared message counter shared between the

communication center and one of the appliances, generates an

authentication word using the message, the value of the shared message

counter and a shared keying variable. Elgamal discloses a method for

authenticating a message using a message authentication code (MAC). The

Elgamal method includes, among other steps, maintaining a shared

sequence number, which meets the limitation of a shared message counter,

at both ends of a communication channel (col. 18, lines 26-30), applying a

message, the shared message counter, and a shared first keying variable,

i.e. a session key, to an authentication algorithm to generate a first

authentication word (col. 17, line 56 – col. 18, line 17), and transmitting the

first authentication word with the message to a receiver wherein the receiver

uses a shared message counter, a shared first authentication keying variable

both stored at the receiver and the received message to generate a second

authentication word configured to be compared with the first authentication

word (col. 18, lines 12-38). It would have been obvious to one of ordinary

skill in the art at the time the invention was made to incorporate the Elgamal

method for authenticating a message using a message authentication code

into the system of Sharrow; in particular, it would have been obvious to one

of ordinary skill in the art at the time the invention was made to maintain a

shared message counter at the appliance communication center and the

appliance, to apply the message, the shared message counter and a shared

first keying variable to an authentication algorithm to generate an

authentication word, and to transmit the authentication word with the

message. The motivation for doing so would have been to allow the receiver

of a message to authenticate the message.

Sharrow does not disclose changing, within the first appliance, a first

keying variable by installing a master keying variable within the first

appliance and the appliance communication center. Elgamal further discloses

changing the first shared keying variable by storing a master keying variable

at both transmitting and receiving devices and using the master keying

variable to generate a new first shared keying variable (col. 7, lines 41-59;

col. 8, line 44 – col. 9, line 12; col. 8, lines 57-67). It would have been

obvious to one of ordinary skill in the art at the time the invention was made

to change the Elgamal method further to change the first shared keying

variable by storing a master keying variable at both ends of the

communication channel and using the master keying variable to generate a

new first shared keying variable, as taught by Elgamal, in order to enhance

security.

Elgamal discloses maintaining a shared message counter in one-to-one

communication. Elgamal does not disclose maintaining multiple shared

message counters by an entity when the entity communicates with two or

more other entities; each of the shared message counters is separately

maintained for each of the other entities. Hoffman discloses that an entity

(i.e., the data processing center) communicates with other entities (BIA

devices) and that the entity maintains multiple shared message counters,
each of the shared message counter is separately maintained for each of the
other entities (fig. 8; col. 29, line 42 – col. 30, line 59). Since the Sharrow
appliance communication center communicates with multiple appliances, it
would have been obvious to one of ordinary skill in the art at the time the
invention was made to further modify the Sharrow method to maintain, at
the appliance communication center, multiple shared message counters,
each of the shared message counter is separately maintained for each of the
devices, as taught by Hoffman. The motivation for doing so would have
been to prevent replay attack when one entity communicates with two or
more other entities.

Elgamal and Hoffman do not disclose that their counters are non-
resettable. The "Commercial Laundry Services" reference discloses using
non-resettable counter to insure accountability (see At Jetz, Security is a
key). It would have been obvious to one of ordinary skill in the art at the
time the invention was made to further modify the Sharrow system such
that the counters are non-resettable, as taught in "Commercial Laundry
Services", in order to insure accountability.

Regarding claim 27, Elgamal further discloses incrementing the shared
message counter, as stored in the sending side, after transmitting the
authenticated message (col. 18, lines 24-30).

Regarding claim 30, Sharrow discloses a method comprising: at an appliance, applying an appliance message to an algorithm to generate a checksum value (fig. 3), and transmitting the appliance message and the checksum by the appliance to an appliance communication center (fig. 3).

Sharrow does not disclose maintaining a shared message counter at the first appliance and the appliance communication center, using the shared message counter and a shared first keying variable to generate the authentication word. Elgamal discloses a method for authenticating a message using a message authentication code (MAC). The Elgamal method includes, among other steps, maintaining a shared sequence number, which meets the limitation of a shared message counter, at both ends of a communication channel (col. 18, lines 26-30), applying a message, the shared message counter, and a shared first keying variable, i.e. a session key, to an authentication algorithm to generate a first authentication word (col. 17, line 56 – col. 18, line 17), and transmitting the first authentication word with the message to a receiver wherein the receiver uses a shared message counter, a shared first authentication keying variable both stored at the receiver and the received message to generate a second authentication word configured to be compared with the first authentication word (col. 18, lines 12-38). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Elgamal method for

authenticating a message using a message authentication code into the

system of Sharrow; in particular, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to maintain a

shared message counter at the appliance communication center and the

appliance, to apply the message, the shared message counter and a shared

first keying variable to an authentication algorithm to generate an

authentication word, and to transmit the authentication word with the

message. The motivation for doing so would have been to allow the receiver

of a message to authenticate the message.

Sharrow does not disclose changing, within the first appliance, a first

keying variable by installing a master keying variable within the first

appliance and the appliance communication center. Elgamal further discloses

changing the first shared keying variable by storing a master keying variable

at both transmitting and receiving devices and using the master keying

variable to generate a new first shared keying variable (col. 7, lines 41-59;

col. 8, line 44 – col. 9, line 12; col. 8, lines 57-67). It would have been

obvious to one of ordinary skill in the art at the time the invention was made

to change the Elgamal method further to change the first shared keying

variable by storing a master keying variable at both ends of the

communication channel and using the master keying variable to generate a

new first shared keying variable, as taught by Elgamal, in order to enhance

security.

Elgamal discloses maintaining a shared message counter in one-to-one

communication. Elgamal does not disclose maintaining multiple shared

message counters by an entity when the entity communicates with two or

more other entities; each of the shared message counters is separately

maintained for each of the other entities. Hoffman discloses that an entity

(i.e., the data processing center) communicates with other entities (BIA

devices) and that the entity maintains multiple shared message counters,

each of the shared message counter is separately maintained for each of the

other entities (fig. 8; col. 29, line 42 – col. 30, line 59). Since the Sharrow

appliance communication center communicates with multiple appliances, it

would have been obvious to one of ordinary skill in the art at the time the

invention was made to further modify the Sharrow method to maintain, at

the appliance communication center, multiple shared message counters,

each of the shared message counter is separately maintained for each of the

devices, as taught by Hoffman. The motivation for doing so would have

been to prevent replay attack when one entity communicates with two or

more other entities.

Elgamal and Hoffman do not disclose that their counters are non-

resettable. The "Commercial Laundry Services" reference discloses using

non-resettable counter to insure accountability (see At Jetz, Security is a

key). It would have been obvious to one of ordinary skill in the art at the

time the invention was made to further modify the Sharrow system such

that the counters are non-resettable, as taught in "Commercial Laundry

Services", in order to insure accountability.

Regarding claim 31, Sharrow further discloses receiving the message

at the appliance communication center (fig. 2; col. 3, lines 23-26). Elgamal

further discloses applying the shared message counter, as stored in the

receiving side, and the received message to an authentication algorithm to

generate a second authentication word and comparing the first and second

authentication words to determine the authenticity of the message (col. 18,

lines 31-38).

12.   Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable

over Sharrow in view of Elgamal and Hoffman as applied to claim 19 above,

and further in view of Kaufman et al ("Network Security Private

Communication in a Public World"). Sharrow and Elgamal disclose using a

shared message counter to generate the first authentication word in claim

16. Elgamal discloses that the authentication algorithm iteratively performs

arithmetic or logical operations (col. 18, lines 4-6). Sharrow and Elgamal do

not disclose using a directional code to generate the first authentication

word, Kaufman teaches using a directional code for authentication (Section

9.3.5 Privacy and Integrity, p. 242, 3rd par). It would have been obvious to

one of ordinary skill in the ad at the time the invention was made to modify

the combined method of Sharrow, Elgamal and Hoffman to use a directional

code for authentication, as taught by Kaufman. Accordingly, the directional

code is used to generate the first authentication word. The motivation for

doing so would have been to be able to prevent a reflection attack. Sharrow

discloses a working register (col. 5, lines 1-5). Sharrow does not disclose

that the working register comprising at least four bytes, the first three bytes

holding the shared message counter the fourth byte holding the directional

code. However, the differences between the claimed working register and

the working register of Sharrow is a matter of design choice since both store

the shared message counter and the directional code.

Allowable Subject Matter

13.   Claims 21-22 objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of

the limitations of the base claim and any intervening claims.

14.   The following is a statement of reasons for the indication of allowable

subject matter. Regarding claim 21, the limitations "forming P as the dot

product of R2 and R0; forming Q as the bitwise exclusive or of P with the

constant expression '01010101'; forming S by adding Q to K; forming S' by

end around rotating S; forming T as the bitwise exclusive or of S' and R3;

forming F as the bitwise exclusive or of T with a byte of the appliance

message; and replacing R3 with R2, R2 with R1, R1 with R0, and R0 with F",

in combination with elements of the parent claims, have not been taught by

prior art.

Conclusion

15.   The prior art made of record and not relied upon is considered

pertinent to applicant's disclosure.

    U.S. Patent No. 4,688,250 to Corrington et al.

    U.S. Patent No. 5,720,034 to Case

Any inquiry concerning this communication or earlier communications

from the examiner should be directed to Minh Dinh whose telephone number

is 571-272-3802. The examiner can normally be reached on Mon-Fri:

10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the

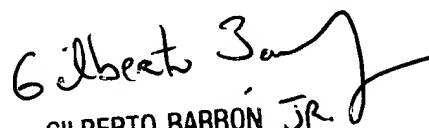examiner's supervisor, Gilberto Barron can be reached on 571-272-3799.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MD

Minh Dinh
Examiner
Art Unit 2132

MD
3/27/06

Gilberto Barron Jr

GILBERTO BARRON JR
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100